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The Importance of Irrigated Agriculture to Nebraska's Economy

Over 65 percent of Nebraska's total crop output in 1985 was produced on less than 40 percent of the state's total cultivated land. The market value of crop output from these 6.1 million acres was just over $1.9 billion. This disproportionate yield was accomplished through irrigation. Irrigation is broadly defined here as a package of resources of which water is one part.

Estimates show that under simulated dryland conditions for 1985, only about $946 million of crop output could have been grown on these acres. The difference of $980 million is the direct contribution or direct impact of irrigation.

The state enjoyed added economic advantages from irrigation, called indirect benefits or indirect impacts. These indirect impacts occurred as a result of the various inputs (such as fertilizer, diesel fuel, insurance, and the like) that were purchased by irrigators for crop production purposes. In net terms, these additional impacts for 1985 totaled about $1.3 billion. (The net concept will be defined later.) These indirect impacts represent sales and incomes of many Nebraska businesses for 1985 whose markets are linked directly and indirectly to irrigated agriculture. Indirect benefits typically exceed direct benefits. Such is the case for irrigated agriculture, which means that nonagricultural businesses tend to gain the most from irrigated agriculture.

Considerable interest in the last 25 years has focused on the economic importance of irrigated agriculture to the state's economy. The economic importance of irrigated agriculture was determined in a 1963 study by constructing an analytical model, called an input-output model, that identified the economic relationships between irrigated agriculture and other industries or sectors in Nebraska for the year 1963. This study concluded that in 1963 dollars, the $121 million net increase in crop output due to irrigation generated an additional $160 million in indirect benefits to the state's economy.[1] A similar study was conducted in 1974 of the period 1967 through 1970. This second study also concluded that the state receives substantial economic benefits from irrigation.

This article is based on a study of irrigated agriculture for 1985. 1985 was chosen as the study period because it represents the most recent year for which complete economic information is available to construct a state input-output model.

An input-output model is an excellent tool for identifying and measuring economic impacts--it can be constructed for regional economies; it can provide considerable industry detail; and it can produce industry impact multipliers. An input-output model shows the various inter-industry relationships or linkages between producers and suppliers for some accounting period. An example of an inter-industry relationship or linkage would be the purchase of fertilizer from a fertilizer dealer by an irrigator. Many thousands of similar transactions occur during an accounting period. These can be summarized in an input-output model as aggregations of transactions among industries or sectors. For instance, the preceding example would appear in an input-output framework as a transaction between the irrigated crops sector and the trade sector. The 1985 state input-output model contains 78 producing sectors and estimates of the inter-industry transactions among these producing sectors.

Inter-industry transactions create a multiplier effect—a change in the output of one industry will generate or induce changes in the outputs of many other industries in the economy. Therefore, total economic activity or output increases by some multiple of the initial change in output. This multiple effect or impact is captured in the popular economic multiplier concept. The popularity of input-output models is due largely to the ability to produce industry specific impact multipliers. For example, the industry multiplier for the irrigated crops sector in the 1985 Nebraska input-output model is $2.21. The $2.21 figure means that on average each dollar of irrigated crop output in 1985 generated a total of $2.21 of gross output in Nebraska for that year. One dollar of the $2.21 multiplier represents the dollar of

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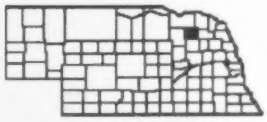
County of the Month

Pierce



Size of county: 573 square miles, ranks 58th in the state
Population: 8,400 (estimated) in 1987, -0.7 percent from 1980
Per capita personal income: $13,072 in 1986, ranks 41st in the state
Unemployment rate: 4.3 percent in Pierce County, 4.9 percent in Nebraska for 1987
Net taxable retail sales ($000, unadjusted for inflation): $18,260 in 1987, a change of -7.4 percent from 1986; $19,938 during January-August, 1988, +12.8 percent from the same period one year ago
Nonfarm employment (1987):

	State	Pierce County
Wage & salary workers	659,223	1,602
	(percent of total)	
Manufacturing	13.3%	5.6%
Construction and Mining	3.9	4.3
TCU	6.5	10.6
Retail Trade	18.7	18.4
Wholesale Trade	7.1	10.5
FIRE	7.3	4.7
Services	22.7	19.2
Government	20.5	26.7
Total	100.0%	100.0%

Agriculture:
Number of farms: 865 in 1982, 932 in 1978
Average farm size: 370 acres in 1982
Market value of farm products sold: $72 million in 1982 ($83,281 average per farm)

Sources:
Bureau of the Census: *Area Measurement Reports*, 1970; *Census of Agriculture*, 1982; *Census of Population*, 1980; *Provisional Estimates of the Population of Counties*, 1986
Bureau of Economic Analysis: *Survey of Current Business*, April 1988
Nebraska Department of Labor: *Labor Market Summary Report*, 1987
Nebraska Department of Revenue: *Net Taxable Sales* M.W.E.

Irrigation (continued)

direct irrigated crop output. The remainder, $1.21, represents additional indirect benefits to Nebraska businesses. A similar industry multiplier was determined from the input-output model for the dryland crops sector. The dryland crops multiplier was calculated to be $2.07 for 1985. Both multipliers were used to calculate the current indirect impacts of irrigated agriculture.

This article describes how the direct and indirect benefits of irrigated agriculture were calculated for the 1985 study period. It is important to point out the distinction between current benefits and investment benefits. Current benefits or impacts refer to the short-run impacts due to additional production during a single production or processing period. Investment impacts refer to investment activity attributable to the capital expansion of an industry, such as growth in irrigated agriculture. Investment impacts were not measured in this latest study, because the study period was limited to 1985. Therefore, the discussion that follows involves only current impacts. For brevity, current impacts will be termed impacts.

Direct Impact

The direct impact of irrigated crops was defined as equal to the 1985 output of the irrigated crops sector minus what could have been produced on the irrigated land under dryland simulated conditions. Estimates of the dryland equivalents are given in Table 1 with the actual irrigated crop output by crop for 1985. The irrigated crops considered in the study include corn, grain sorghum, soybeans, wheat, and sugar beets.

Table 1
Irrigated and Dryland Equivalent Output:
By Crop for 1985
($1,000s)

Crop	Irrigated Crop Output	Dryland Equivalent Output
Corn	$1,701,224.00	$449,900.20
Grain Sorghum	48,445.25	318,866.70
Soybeans	124,416.00	126,232.40
Wheat	17,036.25	48,689.20
Grass, Fallow, & Idle	—	2,117.50
Sugar Beets	35,027.00	—
Total	$1,926,148.50	$945,806.00

The dryland equivalents require some explanation. These hypothetical outputs for 1985 were simulated for irrigated crop acres. Each of the irrigated crops hypothetically was removed from production and a dryland crop or use was substituted. Dryland equivalent crops and yields for 1985 were determined on the basis of soil conditions and climatic factors by Crop Reporting District (CRD). The opinions of several Cooperative Extension Service specialists from a number of the CRDs were used to finalize the estimates of simulated dryland yields for dryland equivalent crop outputs. The market values of the dryland crop equivalents shown in Table 1 are based on actual 1985 market conditions. It was assumed that because food and feed grain prices are determined in world markets, the magnitude of the change in cropping patterns and outputs that would occur as a result of the simulated dryland conditions would not have any measurable effect on market prices.

The dryland crop equivalents given in Table 1 reflect a major change in cropping patterns between irrigation and dryland. This change is even more evident in the acreage allocations by crop that are shown in Table 2.

Table 2
Irrigated and Dryland Equivalent Acreage:
By Crop for 1985

Crop	Irrigated Acres	Dryland Equivalent
Corn	5,050,000 (83%)	2,496,470 (41%)
Grain Sorghum	217,000 (4%)	1,879,090 (31%)
Soybeans	640,000 (11%)	746,440 (12%)
Wheat	105,000 (2%)	414,050 (7%)
Grass, Fallow, & Idle	— (0%)	529,150 (9%)
Sugar Beets	53,200 (<1%)	— (0%)
Total	6,065,200 (100%)	6,065,200 (100%)

Irrigated agriculture in Nebraska is predominantly irrigated corn. In 1985, 83 percent of irrigated land was allocated to corn production. Corn production dropped to 41 percent under simulated dryland conditions. Table 2 shows that approximately 2.5 million acres of irrigated corn would shift to grain sorghum and wheat production under dryland conditions. It was assumed that no sugar beet production would occur under dryland conditions, because the state's total output of sugar beets is concentrated in western Nebraska. It also was assumed that about 0.5 million acres of irrigated land would be diverted to grass, fallow, and idle land. This would occur mostly in northwest and north central Nebraska.

The total direct effect of irrigated agriculture, as shown in Table 3, was estimated at about $980 million. The negative figures recorded in Table 3 indicate the simulated allocation of irrigated corn acres to more drought resistant crops such as grain sorghum, soybeans, and wheat. The $980 million figure is a net estimate of the direct impact of irrigated agriculture for 1985.

Table 3
Direct Impacts By Crop for 1985
($1,000s)

Crop	Direct Impact
Corn	1,251,323.80
Grain Sorghum	-270,421.45
Soybeans	-1,816.40
Wheat	-31,652.95
Grass, Fallow, & Idle	-2,117.50
Sugar Beets	35,027.00
Total	980,342.50

Indirect Impact

The net increase in gross output (income) of over $980 million, shown in Table 3, is a measure of the direct impact of irrigated agriculture in Nebraska for 1985. To produce this net increase in gross output, the irrigated crops sector purchased a number of inputs. The suppliers of these inputs, in turn, purchased inputs, and so on. Irrigation's direct impact of $980 million, measured in net terms, triggered many rounds of additional transactions or indirect impacts for inputs of goods and services. Some of these were goods and services produced within Nebraska and some were imported. The indirect impact pertains to the total transactions generated from the spending and respending activities associated only with those goods and services produced within the Nebraska economy.

It was estimated from the state's 1985 input-output model that each dollar of output (gross income) from irrigated crops required on average about 4 cents of chemicals (e.g., fertilizer) from the chemicals sector, about one cent from finance and insurance, and so on. These supplying sectors in turn purchased inputs in order to produce the goods and services going to irrigated crops.

A similar wave of spending occurred from payments (income) to the household sector. It was estimated that households received about 19 cents for every dollar of irrigated crop production in 1985. Households in turn spent a substantial portion of this income on goods and services (household consumption). This household consumption had a multiplier effect on Nebraska's economy that was included as part of the indirect impact of irrigation.

The accumulated effects of these many rounds of expenditures by industry and households were estimated from the state's input-output model as industry multipliers. To determine the indirect impact of irrigated agriculture, net of dryland equivalent outputs, industry multipliers for dryland crop production and irrigated crop production were used.

By applying the irrigated and dryland industry multipliers to the irrigated crop output and dryland equivalent output, respectively, the indirect impact of irrigated crops, in net terms, was estimated. The product of the irrigated crop multiplier of $2.21 and the total value of irrigated crops from Table 1 yields the total economic impact of irrigated crops for 1985. The total impact, in gross terms, was about $4.25 billion (2.20517 x $1,926,148,500 = $4,247,484,900). The $4.25 billion figure includes both the direct and the indirect impacts.

The indirect impact is determined by subtracting the value of irrigated crop production of $1,926,148,500 (Table 1) from the total impact figure of $4,247,484,900. The difference of about $2.32 billion (or $2,321,336,400) is the indirect impact of irrigation before any adjustments for dryland equivalents. In other words, the $2.32 billion is not net of the dryland equivalent output.

The product of the dryland crop multiplier of $2.07 and the total value of the simulated dryland equivalent crop output in Table 1 gives an estimate of the total economic impact that would have occurred if irrigated land had been used for dryland production. This product is $1,956,796,900 (2.06892 x $945,806,000 = $1,956,796,900). The difference between $1,956,796,900 and the dryland equivalent output value of $945,860,000 is an estimate of the indirect economic impact for simulated dryland crop production, which is $1,010,990,900 ($1,956,796,900 - $945,806,000 = $1,010,990,900).

The indirect economic impact of irrigated crops, in net terms, can be determined by subtracting the indirect impact figure of $1,010,990,900 for simulated dryland crop production from the indirect impact figure of $2,321,336,400 for irrigated crop production. This difference is $1,310,345,500 which, in net terms, is an estimate of the indirect economic impact of irrigated crop production for Nebraska. An estimate of the total economic impact of irrigated crop production, in net terms, is the sum of the direct impact and the indirect impact, approximately $2.3 billion ($980,342,500 + $1,310,345,500 = $2,290,688,000).

An alternative way to interpret the $2.3 billion impact estimate is to think of it as the amount of economic loss that would result in Nebraska with no irrigation. This loss would represent foregone receipts and incomes for many businesses across the state.

The inter-industry information contained in an input-output model can be used to show impacts by industry. Table 4 provides a summary of these impacts for major industries.

Table 4 shows that approximately $476 million was added to Nebraska personal income in 1985 as a result of irrigation. Trade

earned over $150 million in trade margins. Assuming a 14 percent average trade margin (mark-up), the $150 million represents over $1 billion in gross receipts for trade.

Table 4
Indirect Effects By Industry for 1985
($1,000s)

Industry	Impact
Manufacturing	$ 224,724.25
Transportation, Communications, and Utilities	96,179.36
Trade	154,358.70
Finance, Insurance and Real Estate	144,662.14
Services	160,910.43
Other	53,069.00
Personal Income	476,441.62
Total	$1,310,345.50

Summary

Two points need to be emphasized. First, current impacts do not include the many rounds of transactions that are associated directly and indirectly with capital expenditures (or investments). The purchase of center pivots, gated pipe, pumps, and motors that are used for irrigation contribute both directly and indirectly to Nebraska's economy. Information on expenditures for plant and equipment would be necessary to estimate the investment impacts due to irrigation.

The second point pertains to the measurement of impacts on an annual basis. The $2.3 billion net impact figure for irrigation is only for 1985. Similar impacts occur annually. The two earlier studies on irrigated agriculture and the most recent 1985 study, which is the backbone of this article, support this point.

Endnote

1. Lamphear, F. Charles and Theodore W. Roesler, "Impact Analysis of Irrigated Agriculture on Nebraska's Economy, 1967-1970," *Nebraska Economic and Business Report Number Eight* (Lincoln, NE: University of Nebraska-Lincoln, Bureau of Business Research, 1974).

F.C.L. and M.W.E.

Restoring the U.S. Competitive Edge--Part II

What we can do to restore the U.S. competitive edge in the global marketplace? U.S. corporations must set their long-term goals high and relentlessly pursue these goals. In other words, we must pursue excellence. Most of us are tired of hearing this word. But excellence is not merely a dream, euphoria, or intangible target. Excellence comes from consistent commitment to change, innovation, and small revolutions in mundane day-in and day-out quality work. We should pursue excellence in the global marketplace rather than just in our local community.

There are many exceptional U.S. firms that are dominant in the international market, such as IBM, Merck, Johnson & Johnson, 3M, Hewlett-Packard, and GE. These firms have one thing in common. They pursue excellence by relying on the talents and creativity of their employees. The development of strategies that capture the real corporate resource—human talents—is the only way to restore the U.S. competitive edge. The following should be included in our strategies:

Intrapreneurship

Intrapreneurship is a coined word representing intra-organizational entrepreneurship. Intrapreneurs are those who dream and do. To develop and encourage intrapreneurs, large corporations act as venture capitalists for the individuals with new ideas. This involves not only financial backing for individuals with visions, but it also represents the creation of an environment where a person's creativity and desire for experimentation are valued and rewarded.

There are many outstanding examples of intrapreneurship. Perhaps the best known is 3M's Art Fry, who developed Post-it notes. Other outstanding examples include DuPont's automatic chemical analyzer developed by Dick Nadeau (which brings in $300 million in sales per year), Ford's Team Taurus, and many others. U.S. corporations with successful intrapreneurship programs are rare, however. Japan's Matsushita Electric Industrial Company boasts being the company with the most employee-suggested ideas implemented. Their record is 100 suggestions per employee per year. Canon is second with 70, and Toyota follows with 50. The average number of employee suggestions implemented by U.S. corporations is 0.14 per employee per year.

Technology Management

We must do a much better job in technology management. U.S. efforts in research and development have been discipline-driven, whereas our overseas competitors have been concentrating on market-driven research and development. Basic research is necessary for applied research downstream. Nevertheless, we must streamline our research efforts to improve our competitive edge in the global market. In this regard, we must be oriented toward the long term rather than looking for short-term gains. The U.S. invented and developed robots. We sold licenses to the Japanese to build robots and further develop the technology. Since then, the U.S. has been purchasing about 70 percent of all robots in use from Japan.

Perhaps the most important area where we need definite national and corporate strategies is technology transfer from laboratories to enterprises. We have a total lack of coordinated effort in this regard. Furthermore, we have not done a good job in developing systematic interface strategies between technology and human resources. The bottleneck of our inability to fully utilize our superior technologies has been this interface management problem.

Quality Management

The emphasis of our organizations should be on the quality of their products and services. Quality is an elusive term,

dependent on individual preferences and comparative perspective. A commitment to quality is essential to restore our competitive edge.

Quality requires more than just dedication; it must be embedded in corporate strategies. Contrary to the general belief that quality requires additional resources, improved quality saves money when all factors are considered. Management leadership is required in creating a corporate culture that demands and breathes quality in everything a firm does.

Quality is something that has to be built, not inspected to assure its existence. Many organizations emphasize inspection rather than helping employees do it right the first time. The critical factor for quality assurance is relegating decision making to the lowest level possible. Providing good working conditions, technical support, tools, and training is essential for high quality performance on the part of employees. Leadership does not always rest on management. The point of contact between the customer and the firm is where leadership starts. The person who greets a customer at the service counter, a telephone operator who handles in-coming calls, and an assembly line worker who handles parts with care represent those who exercise leadership.

Management by Ideology

We live in the age of information. The currency of the future society will be information. Already organizations expend approximately 70 percent of their capital investments in information-related items. This emphasis on information exacerbates our tendency to rely on tangible facts. It follows that organizations concentrate on structure, systems, and strategies—things that are clear-cut and readily discernible. These are relatively easy aspects of management, however. Things that are intangible, hard to handle, and that energize persons are difficult to manage. Corporate culture, management style, skills, and staffing philosophy come are examples.

Organizational culture represents the basic ideals, values, and philosophies that exist within an organization. It represents invisible, ambiguous, yet clearly accepted codes of behavior in the organization. Developing a constructive culture that can energize and rally every member of the organization for a common purpose is extremely important for the success of an organization. It is because of the age of information, which demands greater instrumentation and structure for the organization, that we need to pay greater attention to management by ideology.

International Perspective

We live in a very exciting time. It is the turning of an era—from a domestic age to a global age; from an industrial age to an information age; and from U.S. eminence to a network of developed nations. The key for our success is our ability to realize the interdependence among the nations of the world. Our overseas competitors need us and we also need them. It is not a zero-sum game. We can continue expanding the pie so that our piece can get bigger while theirs grows simultaneously.

We no longer dominate the world in everything. Perhaps that is better for the U.S. We need to understand the cultures and desires of the other peoples of the world. After all, we are citizens of this world. To restore our competitive edge, we must learn to speak their languages and put ourselves in their shoes. In the process, we will more than merely regain our competitive edge. We will become cosmopolitan, world class citizens.

This article is the second in a series by Dr. Sang Lee. Dr. Lee is University Eminent Scholar, Professor of Management, and Chairman of the Department of Management in the College of Business Administration at the University of Nebraska-Lincoln. Dr. Lee is also the executive director of the Nebraska Productivity and Entrepreneurship Center.

Review and Outlook

National Outlook

What a difference a month makes. Thirty days ago, I wrote a positive piece about the near term outlook for this outlook. At that time, other observers of the economic scene were writing pessimistic pieces. One leading national forecasting firm told us a recession was at hand. Now the news is filled with reports of glowing economic health. The pessimists are assuring us that the economy is too healthy and that the Federal Reserve will have to crack down.

Is there any basis for pessimism? Is there a recession looming on the horizon? If so, when will it occur? My answers are yes, probably, and who knows. I will elaborate later. First, let's review the latest economic news.

In October the Consumer Price Index rose 0.4 percent above September. That figure was 4.2 percent above the previous year's value. Omitting food and energy, the value was 4.6 percent above the year ago value. Although this is cause for concern, it is not cause for alarm. The picture is rosier when we look at the Producer Price Index. The Producer Price Index in October was unchanged from September. When compared to year ago values, the total index of finished goods advanced 2.8 percent. Crude materials increased 0.6 percent from year ago. (See Table III.)

Further good news was found in the personal income figures for October. In that month, personal income rose 1.8 percent above the previous month. A large part of the increase was due to two sources: farm payments (both regular farm payments and special drought payments) and bonuses paid to auto workers. Without those effects, the increase was 0.9 percent—still a healthy gain.

The capital goods sector also is booming. This surge is tied to increases in export activity due to the fall in value of the U.S. dollar. Industrial production in October gained 0.4 percent, raising the index to 139.2 for the month of October. That figure is 5.1 percent ahead of last year and is a full percentage point above the third quarter amount shown in Table I.

Housing starts shared in the good news for October, advancing 7.2 percent. That gain may be temporary as mortgage rates were at a seven month low. With the prime rate jump to 10.5 percent, it is reasonable to expect that the mortgage rate will reverse quickly.

Automobile sales are still off their summer pace. Nevertheless, auto producers remain optimistic. Fourth quarter plans call for an 11.6 percent increase above year ago levels. That optimism will carry through the first quarter of 1989 when auto

producers expect to expand their output by nearly 14 percent from the previous year.

Capacity utilization, a measure of total industrial production relative to total industrial capacity, is now 84.0 percent. That level has not been seen since 1980. When one recalls the rates of inflation at that time, capacity utilization levels may be viewed as a sign that low inflation rates may be ending.

Let us look at possible causes for pessimism about the near term outlook. The basic thesis of the pessimists is that things have been too good for too long. They view the economy as undergoing unspecified pressures. What pressures should we be examining?

I usually start by looking at capacity utilization rates, as they seem to be a critical element in the inflation scenario. Capacity utilization rates are high. The capacity utilization index will never reach 100 percent, and many suspect that it's impossible to go as high as 90 percent. Capacity utilization of 84 percent leaves scant room for further gains. Typically, inflationary pressure is associated with capacity utilization in the low 80 percent range.

Furthermore, there is little likelihood of major capital infusions in the near term which would expand our capacity levels. In the last two years, private investment in both residential and nonresidential structures has been flat on a current dollar basis. That means that on a real-dollar basis, private construction investment has been declining. Only investment in public construction has remained on the up side in current dollars. Even that has decreased in real terms since last year. Given the length of the current expansion, it is unlikely that we will see a near term investment boom in construction.

Until now there has been little pressure on prices. The classic pattern calls for increases in primary prices working their way through finished goods. Although there had been some pressure on food prices from the drought, that pressure is now waning.

We have had good news on energy for some time. The recent OPEC agreements could reverse that. OPEC oil ministers have agreed to raise prices and limit production quotas starting January 1. We won't know how effective the agreement will be until then. In fact, the Arab Emirates have indicated that they won't comply with the agreement. The new agreement allows all members to dump on the oil market if one member is found to be cheating. Meanwhile, there is broad speculation that all members will cheat until the January 1 starting date. The near term outlook is for low energy inflation.

These conditions in the OPEC agreement and in OPEC member behavior are not the basis for a sound cartel. There is speculation that the agreement will not hold. If the agreement is maintained, estimates are that the new OPEC agreement may add 1 percent to the U.S. inflation rate.

Not much else is happening in the primary materials area. Copper prices have increased recently, but then have retrenched somewhat. Major copper producers abroad have the same nationalistic problems that characterize many of the smaller oil states. Both groups need foreign exchange brought by exports of their primary products. They also are characterized by less than stable political situations. The motive is to produce and produce. These countries want to keep their workers happy, even if it means short-term losses.

Another source of primary cost pressure is in the labor market. As reported in the last issue, there is not much happening. Union settlements so far this year have been tame.

Overall inflation rates have advanced this year. In 1986 we experienced a low 3 percent gain in prices. In 1987 we had 4 percent gains. In 1988 we are approaching 5 percent on various prices. All are still low by the standards of the late 1970s and the early 1980s.

The concern is that inflation will accelerate into the 8, 9, and 10 percent area. If that happens, what will the Federal Reserve do? Most economists blame the 1981-1982 recession on the Federal Reserve and their efforts to cure inflation. At a minimum, the severity and length of the recession are assigned to the Federal Reserve. We do not know what Alan Greenspan and his board will do.

After the stock market debacle last year, the Fed rapidly increased the supply of money. Their fear was that the stock market crash would have real effects upon the economy. Monetary growth, as measured by M2, peaked in late March. At that time, M2 was expanding at a 10 percent rate. The growth rate of M2 steadily has declined and is now in the 2 percent range.

My concern is that although 10 percent rate of expansion of M2 was too much, 2 percent may be too low. Are we back to an era when the Fed alternately slams on the brakes and floors the accelerator? It is bad enough for an economy to create its own downturns, but policy-induced downturns are nonsense. We hope that the Fed will not overreact and halt the expansion.

That brings us to government policy. The political scene over the last three decades has witnessed a reversal of the political parties. In the early 1950s and 1960s, Democrats argued that balancing the budget wasn't a priority—expanding the economy was. Republicans then advocated strictly balanced budgets. Today the roles are almost reversed.

Two items about the federal deficit are bothersome. One is that the net interest paid on the debt has risen from 7 percent of the total federal budget in 1963 to around 14 percent today. Second, although 25 years ago a small percentage of those interest payments went to foreigners (and, therefore, federal interest payments recirculated within the U.S. economy), payment to foreigners has risen substantially.

I am concerned about the upcoming budget. If the president-elect's campaign rhetoric holds, he is unwilling to raise taxes, doesn't want to touch the military budget, can't do anything about interest payments, and will have a hard time getting at off-budget items. That leaves only 40 percent of the federal budget that can be cut. If the goal were a 10 percent cut in total federal spending, the touchable items would have to be reduced 25 percent. A cut of that size in the short run would devastate most government programs. Perhaps that is why some individuals believe that taxes must be raised in order to cure the deficit problem.

Suppose that the pessimists are correct and the recession begins in either 1989 or 1990. Is it appropriate to raise taxes and cut government spending during a recession? The Keynesian answer is no. The time for budget balancing is in an expansion, not a downturn. We have had six years of expansion to do something about the deficit, yet nothing effective has been done.

We have strayed from our original answers to questions, but I think we have reinforced the idea that a recession is possible. Our argument is that it is likely to be a recession based on bad policy ... an overreaction to bad short-term news or wrong policy for the times.

How likely is a recession? Unfortunately, I think that there is a strong possibility of a recession in the near term. Economic theory says that a balancing act at a right rate of growth is a possibility. Some believe that right rate is under 3 percent. Could we maintain a 2 to 2.5 percent growth rate indefinitely? Perhaps. But the economy does not run smoothly. Sectors move out of balance. We have noted that housing has been on a long-term down trend over the last couple of years. At a mature stage in the business cycle, the economy is especially vulnerable to shocks. These shocks can be external (such as the Arab oil embargo over a decade ago) or they can be due to internal policy. A long-term balancing act is hard to perform.

When will a recession happen? A look at the forecasting record of selected economists in the early 1980s reveals that pinpointing a recession is nearly impossible. Economists generally predicted the overall size of the 1980 downturn correctly. But they were wrong in projecting the timing of that recession. That recession was unusual. There was a single large quarter downturn of 9 percent, at annual rates, in the second quarter in 1980.

The record of forecasters for the 1981-1982 recession is not as good. Virtually all the forecasters missed the start of that recession; once it began, they missed the duration of that recession. At the end of 1981, when the forecasters had an opportunity to state their outlook for 1982, nearly all expected the economy to recover. It did not—the recession continued nearly the entire year. That leaves the score one out of two for calling recessions with no bonus points for timing in either case. If that is not a sufficient example of bad forecasting, let me point out that we have had doomsayers forecasting downturns for the last two years.

My conclusion is that a recession is possible in the near term and even likely. When it will start is hard to know. We expect to see more conditions in evidence before we would say that a downturn is imminent. Outside some large external shock, the things to watch for are an increase in inflation and the response of the Federal Reserve. The latter is indicated by either changes in the growth rates of money supply or rapid changes in interest rates.

Nebraska Outlook

Nebraska continued to experience good news. Unemployment rates remain low in the state, both in the metro and nonmetro area. The state unemployment rate for October remained at 3.2 percent, compared to the national level of unemployment in October of 5.3 percent. National unemployment in November advanced to 5.4 percent. Nebraska remains well below national standards for unemployment.

Retail sales in Nebraska in the month of August rose substantially. The gain in retail sales was led by motor vehicle sales which were 16.4 percent above year ago levels. Motor vehicle sales are likely to dip in September and perhaps again in October, reflecting national trends in automobile sales. Nonmotor vehicle sales advanced 5.4 percent in the month of August. That figure shows only a slight improvement above rates of inflation experienced over the year. Building activity in the state remains strong, especially outside the metropolitan areas.

How do we relate activity in the national economy to the state economy? The nonagricultural sector of the Nebraska economy is likely to broadly parallel movements in the national economy. Because Nebraska tends to be more service dominated than the nation, we may weather a future recession fairly well. The Nebraska manufacturing sector tends to be dominated by food manufacturing, a segment showing less cyclicality than other manufacturing. I hesitate to use the words "recession-proof" because they can return to haunt us in the future; nevertheless, Nebraska stands to do well over the near term. That is not to say that some sectors won't suffer under a future downturn. In particular, housing and construction in general tend to be hit hard by high interest rates that characterize early stages of downturns.

The agricultural outlook for the state is somewhat less sanguine. Although there may be some Nebraska farmers,

Table I
National Indicators

	Annual		Quarterly (SAAR)		
	1986	1987	1988I	1988II	1988III
Real GNP (% change)	2.8	3.4	3.4	3.0	2.6
Real Consumption (% change)	4.3	2.7	4.5	3.0	4.0
Housing Starts (millions)	1.81	1.62	1.48	1.48	1.45
Auto Sales (millions)	11.4	10.3	10.8	10.6	10.6
Interest Rate (90 day T-Bill)	5.96	5.82	5.76	6.23	6.99
Unemployment Rate (%)	7.0	6.2	5.7	5.4	5.5
Industrial Production Index (1977=100)	125.1	129.8	134.5	136.0	138.2
Money Supply, M2 (% change)	8.1	6.5	6.8	7.7	3.7

especially on the eastern edge of the state, who have been hurt by the drought, others in the state will do well. Overall, there is a good likelihood that Nebraska farm income this year will exceed that of last year. The retail sales boom shown in the Nebraska data, especially for automobiles and trucks, may be related to a surge in agricultural income.

This leads us to a note of caution. There should be a commensurate surge in Nebraska tax receipts related to any jump in Nebraska farm income. If such a surge does materialize, it is likely to be temporary in nature. It is not a reliable source of of income for future spending. Therefore, any use made of the increase in state funds that are attributable to a drought-related surge in agricultural income should be of a temporary nature. That is why some persons advocate a temporary tax refund. A short-lived public construction project is another possibility.

For next year, the outlook for the Nebraska agricultural sector may entail a downturn in farm income. A recent forecast called for a 10 percent drop in national farm income. If that forecast is correct, Nebraska likely will share in that drop.

How Nebraska retailers will fare during the Christmas rush is now anyone's guess. As you can see from the scoreboard data, there is a significant lag in our receipt of current data. It will be several months before we know the results of the Santa syndrome in our state. We hope the Nebraska shopper will continue to create the strong spending patterns seen in recent months.

J.S.A.

Thanks...

To those stalwart readers who responded to our request for comments on *Business in Nebraska*. We appreciate the suggestions for future articles. We love the compliments. For those of you who had the best of intentions of writing us but thought the deadline had passed, you were wrong. We would still like to hear from you.

Terms to Know

Deficiency Payments

A key provision in the federal government's farm program is the establishment of target prices for grains. These prices are one entry in the formula for determining the deficiency payments made to participating grain producers. The market price and loan rate of the grain are the two other prices that enter the formula. The loan rate is the price that a producer receives for putting the grain into the government storage program.

The first part of the deficiency payment formula is the difference between the target price of the grain and the higher of the market price or loan rate. This difference is known as the payment rate. The payment rate (per bushel basis) is multiplied by the payment yield (bushels per acre) established for the farm. This result is multiplied by the farm program acreage. The final result is the deficiency payment.

A portion of the payment usually is made at the time the producer enrolls in the program prior to planting the crop. This portion is known as the advance deficiency payment and is based on projected yields and prices. The remaining portions of the payment are paid as the marketing year of the crop progresses. Corn, sorghum, wheat, barley, and oats are program crops in Nebraska with deficiency payment provisions.

Deficiency payments received by Nebraska producers have been running at high levels in recent years due to the relatively wide spreads between target prices and market prices or loan rates. It is estimated that deficiency payments to Nebraska producers in calendar year 1988 will be in the range of $1.0 to $1.1 billion. This payment level is about four percent of the total income of the Nebraska economy. The critical role of deficiency

(continued on page 9)

Table II
Employment in Nebraska

	Revised Sept. 1988	Preliminary Oct. 1988	Oct. % Change vs. Year Ago
Place of Work			
Nonfarm	672,296	675,730	1.0
Manufacturing	93,344	94,000	3.5
Durables	46,339	46,365	5.5
Nondurables	47,005	47,635	1.6
Mining	1,717	1,624	-5.2
Construction	25,268	25,098	-0.8
TCU*	44,240	44,919	2.5
Trade	171,690	172,345	0.1
Wholesale	48,040	48,196	1.5
Retail	123,650	124,149	-0.4
FIRE**	48,214	48,168	1.4
Services	150,027	149,178	-0.6
Government	137,796	140,398	1.9
Place of Residence			
Civilian Labor Force	817,758	828,418	0.6
Unemployment Rate	3.2%	3.2%	

*Transportation, Communication, and Utilities
**Finance, Insurance, and Real Estate

Source: Nebraska Department of Labor

Table III
Price Indices

	Oct. 1988	% Change vs. Year Ago	YTD % Change vs. Year Ago
Consumer Price Index - U* (1982-84 = 100)			
All Items	120.2	4.2	4.0
Commodities	113.5	3.8	3.5
Services	127.6	4.7	4.5
Producer Price Index (1982 = 100)			
Finished Goods	109.3	2.8	2.2
Intermediate Materials	108.6	5.3	5.4
Crude Materials	95.8	0.6	2.7
Ag Prices Received (1977 = 100)			
Nebraska	156	17.3	11.6
Crops	139	59.8	36.3
Livestock	166	2.5	3.1
United States	144	13.4	8.5
Crops	135	27.4	18.5
Livestock	153	4.1	1.6

U* = All urban consumers
Source: U.S. Bureau of Labor Statistics

Personnel (continued)

in the UN-L College of Journalism, Young's career has covered both advertising and editorial work.

Bureau newcomer Barbara Sumsion is a California native who attended San Jose City College and holds a degree from Heald College. She brings a wealth of experience to the Bureau, including layout, pasteup, and typesetting skills gained from her employment at Springfield Printing.

The Bureau publication staff also assists with special projects and reports. These cover a broad spectrum of topics, ranging from the economic impact of the University of Nebraska Medical Center to projections of population and income for the state in upcoming years.

State to Age Seven Years in the Next 24 Years

An individual gets one year older every year, but the state will take over three years to advance one year in average age. According to projections recently released by the U.S. Bureau of the Census, Nebraska's population is expected to decrease slightly from 1,598,000 in 1986 to 1,529,000 in 2010. The number of residents over 40 years of age, however, is projected to increase. Consequently, the median age for the state will increase from 31.6 years in 1986 to 38.4 years in 2010. For more details on the future mix of population, contact the Bureau of Business Research.

Payments (continued)

payments in the health of Nebraska's economy is apparent. Declines in deficiency payment levels without fully compensating gains in market prices would have adverse effects on the Nebraska economy.

J.R.S.

Table IV
City Business Indicators
August 1988 Percent Change from Year Ago

The State and Its Trading Centers	Employment (1)	Building Activity (2)
NEBRASKA	1.5	9.0
Alliance	0.2	49.3
Beatrice	-0.1	192.6
Bellevue	3.1	104.8
Blair	3.1	-58.3
Broken Bow	-1.1	-86.8
Chadron	2.6	-82.2
Columbus	7.6	59.0
Fairbury	-1.3	2,387.7
Falls City	-1.4	95.0
Fremont	-0.5	9.8
Grand Island	0.0	27.6
Hastings	-1.3	46.2
Holdrege	-0.8	36.2
Kearney	-0.4	103.9
Lexington	-1.5	228.1
Lincoln	2.1	-7.2
McCook	-2.0	82.5
Nebraska City	-0.9	-13.9
Norfolk	-0.4	-20.7
North Platte	0.0	71.2
Omaha	3.1	-2.6
Scottsbluff/Gering	-0.8	-6.5
Seward	-1.3	-14.3
Sidney	-0.9	-9.6
South Sioux City	3.4	107.8
York	-0.9	-69.4

(1)As a proxy for city employment, total employment (labor force basis) for the county in which a city is located is used.

(2)Building activity is the value of building permits issued as a spread over an appropriate time period of construction. The U.S. Department of Commerce Composite Cost Index is used to adjust construction activity for price changes.

Sources: Nebraska Department of Labor and reports from private and public agencies.

Figure I
City Business Index
August 1988 Percent Change from Year Ago

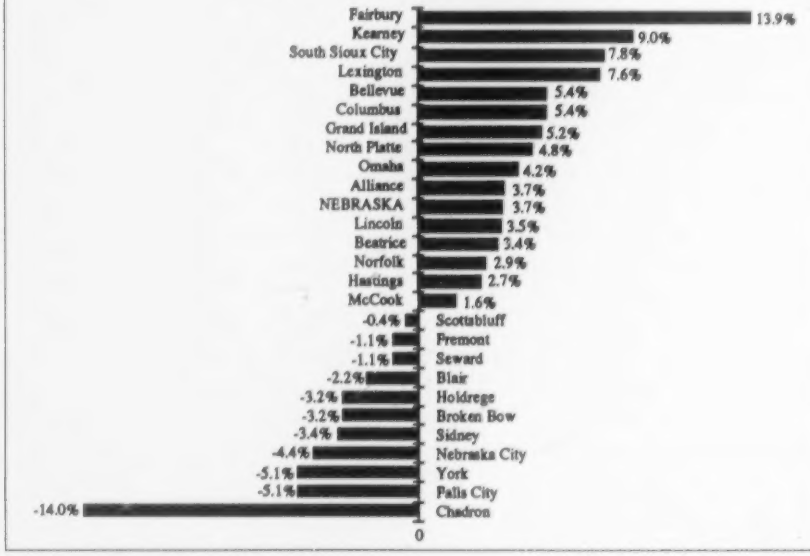
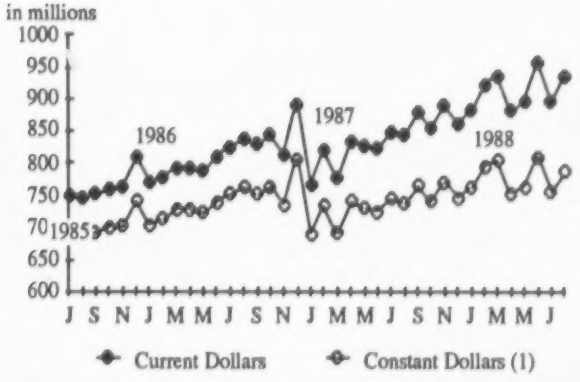


Table V
Net Taxable Retail Sales of Nebraska Regions and Cities

Region Number and City (1)	City Sales (2) Aug. 1988 (000s)	City Sales (2) % Change vs. Year Ago	Region Sales (2) Aug. 1988 (000s)	Region Sales (2) % Change vs. Year Ago	YTD % Change vs. Year Ago
NEBRASKA	$838,916	9.6	$974,185	11.1	11.7
1 Omaha	294,462	10.3	368,497	10.9	8.9
Bellevue	12,574	4.7	*	*	*
Blair	3,869	5.0	*	*	*
2 Lincoln	120,049	10.1	139,157	12.7	12.9
3 South Sioux City	4,396	9.7	6,549	10.1	20.7
4 Nebraska City	3,585	-4.1	17,746	5.2	8.3
6 Fremont	14,460	0.2	27,431	5.1	13.0
West Point	2,430	12.7	*	*	*
7 Falls City	1,753	-14.4	7,952	-7.0	5.3
8 Seward	3,886	4.0	14,188	11.5	12.2
York	6,583	5.6	15,491	9.6	12.2
10 Columbus	13,565	3.0	25,052	6.5	14.8
11 Norfolk	18,062	13.1	32,121	13.5	17.4
Wayne	2,474	-0.6	*	*	*
12 Grand Island	33,713	12.8	48,301	16.3	15.7
13 Hastings	15,087	6.9	23,992	6.1	10.5
14 Beatrice	7,021	-0.7	16,998	4.6	9.3
Fairbury	2,645	0.9	*	*	*
15 Kearney	19,911	16.9	28,205	16.2	18.9
16 Lexington	5,584	9.3	15,627	13.5	19.8
17 Holdrege	3,813	-6.6	7,802	5.1	11.5
18 North Platte	15,534	8.5	19,795	12.7	16.1
19 Ogallala	5,740	6.3	11,290	10.6	13.1
20 McCook	7,661	2.4	11,096	4.4	16.4
21 Sidney	3,814	-2.4	8,438	2.3	8.3
Kimball	1,933	-4.0	*	*	*
22 Scottsbluff/Gering	16,980	4.0	24,425	6.8	6.8
23 Alliance	5,055	7.3	13,897	6.2	11.5
Chadron	2,694	-12.4	*	*	*
24 O'Neill	3,749	4.9	12,984	10.1	15.8
Valentine	2,432	10.4	*	*	*
25 Hartington	1,430	15.0	8,415	5.2	9.2
26 Broken Bow	3,193	19.9	11,772	17.5	20.4

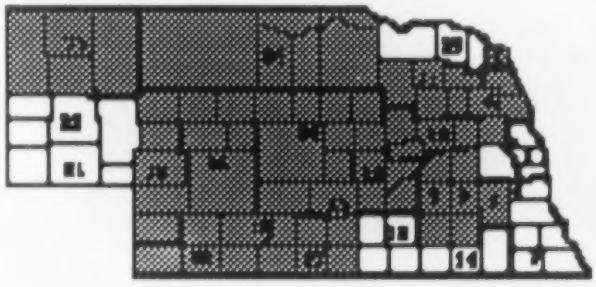
(1) See region map.
(2) Sales on which sales taxes are collected by retailers located in the state. Region totals include motor vehicle sales.
* Within an already designated region.
Compiled from data provided by the Nebraska Department of Revenue

Figure II
Nebraska Net Taxable Retail Sales
(Seasonally Adjusted)



(1) The Consumer Price Index (1982-84 =100) is used to deflate current dollars into constant dollars

Figure III
Region Sales Pattern
YTD as Percent Change from Year Ago



Shaded areas are those with sales gains above the state average.

The Bureau of Business Research announces a conference on the state of the state—a look at how Nebraska's economy works and where it is heading

PROJECTIONS AND CHOICES

Thursday, January 26, 1989, 8:15 a.m. to 3:00 p.m., lunch included
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***Demographic Changes in Nebraska**
Jerry Deichert, UNO Center for Applied Urban Research

***Economic Projections for Nebraska**
James R. Schmidt, UN-L Bureau of Business Research

***A Model of New Nebraska Industry**
F. Charles Lamphear, UN-L Bureau of Business Research

***Educating the New Labor Force**
Stuart Miller, Nebraska Department of Economic Development

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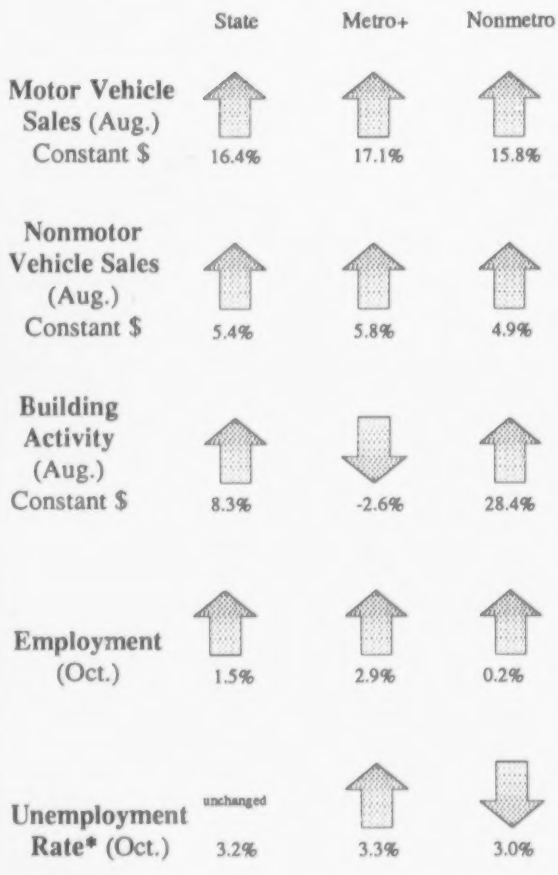
Lodging is available at $36.00 per night at the Nebraska Center. Call 402/472-2949 for further information about lodging.

BB Scoreboard

Percent change from one year ago



+Omaha and Lincoln
*Unemployment is this month's rate, not a percent change from year ago

Bureau Personnel Notes:

Margo Young and Barbara Sumsion

One of the most important components of the outreach function of the Bureau of Business Research is its publication division. Margo Young, editorial assistant, and Barbara Sumsion, composing technician, form the backbone of this field at the Bureau. Working with authors from the College of Business Administration, the Institute of Agriculture, the Nebraska Department of Labor, and other companies, they strive to produce quality works designed to meet the diverse and growing needs of the Nebraska business and academic communities.

The Bureau of Business Research produces four regular publications:

**Business in Nebraska* is a monthly newsletter in its 44th year. It is designed to serve the general business community.

**Quarterly Journal of Business and Economics* (formerly the *Nebraska Journal of Economics and Business*) has been housed in the Bureau for more than a quarter of a century. The Bureau coordinates the efforts of many departments within the College of Business Administration, especially the Department of Finance and the Department of Economics, to make this a respected scholarly journal. Editor George M. McCabe stresses the importance of empirical studies that replicate previous work in the QJBE.

*The Bureau staff also assists George E. Rejda of the Department of Economics to review and edit articles for *Benefits Quarterly*, published by the International Society of Certified Employee Benefit Specialists. Primary readership includes academics and employee benefit practitioners.

**Regional Science Perspectives* is an established publication new to the Bureau of Business Research. Bureau director F. Charles Lamphear edits this journal, which emphasizes regional economic studies.

Margo Young is a journalism graduate of the University of Nebraska-Lincoln whose history includes a long stint with an outstate Nebraska daily newspaper. Currently a graduate student

(continued on page 9)

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